DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's Request for Continued Examination filed on 21 March 2008 and the Supplemental Amendments filed on 7 July 2008 have been entered.

Status of the Claims

2. This action is in response to the Request for Continued Examination filed on 21 March 2008 and the Supplemental Amendments filed on 7 July 2008 in which claims 1-2 and 9-15 were amended, no claims were canceled, and no new claims were added. All of the amendments have been thoroughly reviewed and entered.

The previous rejections under 35 U.S.C. 112, second paragraph, are withdrawn in view of the amendments.

The previous rejections under 35 U.S.C. 103(a) not reiterated below are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed and are addressed following the rejections necessitated by the amendments.

Claims 1-4, 7, and 9-15 are under prosecution.

Information Disclosure Statement

3. The Information Disclosure Statement filed 7 August 2008 is acknowledged. However, Documents 1-13 and 15-16 have been lined through to avoid duplication on the record because Documents 1-2 were previously listed on the Notice of References cited mailed 21 November 2007, Documents 3-5, 8-12, and 15-16 were previously listed on the Information Disclosure Statement filed 21 January 2005, Documents 6-7 were previously listed on the Notice of References cited mailed 18 May 2007, and Document was previously listed on the Information Disclosure Statement filed 18 September 2007.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claim 15 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. This is a new matter rejection necessitated by the amendments. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 15 recites the limitation "the rear side region is brought into planar contact with a coolable or heatable body" at the end of the claim. Paragraph 0045 of the Substitute Specification filed 21 January 2005 describes "areal" contact between cooling and heating body 29. While Figures 5-6 show a flat edge of body 29 near flat

biochip 5, Figures 5-6 do not show the two structures in direct planar contact with one another. In addition, a review of the specification yields no recitation of either "planar contact" between the rear side region with a coolable or heatable body or any teaching of the scale of the drawings.

It is noted that the courts have held that "[w]hen the reference does not disclose that the drawings are to scale and is silent as to dimensions, arguments based on measurement of the drawing features are of little value" (Hockerson-Halberstadt, Inc. v. Avia Group Int 'l, 222 F.3d 951, 956, 55 USPQ2d 1487, 1491 (Fed. Cir. 2000)). See MPEP 2125. Thus, as a result of the lack of dimensions for Figures 5-6, no support for the claimed "planar contact" is found in Figures 5-6.

Therefore, the limitation requiring the rear side region brought into "planar contact" with a coolable or heatable body constitutes new matter.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-4, 7, and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chateau (U.S. Patent No. 4,071,315, issued 31 January 1978) in view of Chen et al (U.S. Patent Application Publication No. US 2001/0051714 A1, published 13 December 2001) in view of Gordon et al (U.S. Patent Application Publication No. US 2001/0036641 A1, published 1 November 2001).

It is noted that the limitation "in which biochips placed onto a substrate having a plurality of measurement spots are used" appears in the preamble of independent claim 1. Because the limitation is in the preamble, the phrase "biochips placed onto a substrate" is not interpreted as a required active step of the claimed method.

Regarding claims 1 and 12, Chateau teaches a method for performing a high throughput analysis. In a single exemplary embodiment, Chateau teaches a method comprising the use of multiple biochips in the form of a multiplicity of successive reaction areas 13 (column 5, lines 10-30 and column 4, lines 15-20). A reaction area (i.e., each reaction area) has one or more reagents fixed thereon (column 1, lines 5-10), and the reagents are biomolecules in the form of antibodies pre-attached to the reactions areas (column 3, lines 50-67). The reaction areas are on a tape on a

substrate; namely, reaction areas 13 are formed on a longitudinal tape that allows continuous analysis of the plurality of samples (column 3, lines 1-67 and Abstract). Thus, the tape is interpreted as the instantly claimed substrate, the biochips are interpreted as the reactions areas 13 on the tape (Figure 1), and the reaction areas 13 are interpreted as having a plurality of measurement reagents fixed thereon. A sample liquid, in the form of serum containing antibodies to the antigen spots of the biochips, is then deposited on the successive biochips 13 (column 5, line 60-column 6, line 10). Because each biochip 13 has one or more reagents fixed thereon (column 1, lines 5-10), the sample liquid is applied to a plurality of measurement reagents fixed on the biochip 13. Chateau teaches flushing liquids are applied from above the substrate onto the fixed antibody locations of the biochips located on the substrate; namely, the tape is rinsed in rinsing station 25 from above (Figure 1 and column 6, lines 10-25). Chateau also teaches analyzing the samples of measurement liquid, wherein applying and analyzing are effected simultaneously at different biochips; namely, depositing and processing (i.e., analyzing) of several side by side specimens (i.e., in different biochips 13) occurs simultaneously with the recording (i.e., measuring) of information regarding each specimen and the treatment that is given to each specimen (i.e., at each biochip 13; column 2, lines 57-67). The substrate is moved to permit a continuous measurement at a speed determined by a movement cycle of the substrate; namely, depositing stations are multiplied so that multiple simultaneous analyses are carried out by the machine, wherein the tape is progressed by a number of areas as part of the

depositing and analysis (column 5, lines 10-30). The progression of the tape is the claimed movement cycle.

While Chateau teaches each biochip 13 has one or more reagents fixed thereon (column 1, lines 5-10), Chateau does not explicitly teach the plurality of fixed reagents are spotted in an array (i.e., are formed as spots in an array; claim 1), nor does Chateau teach electrical measurements are carried out from below the substrate with the aid of contact elements; i.e., a tape having electrical contact elements (claim 1).

However, Chen et al teach a substrate in the form of a flexible tape (Abstract) having spots of probes thereon (paragraph 0017). Chen et al teach the spotting of the probes to form an array has the added advantage of allowing deposition of probe molecules on a tape on a high speed in a continuous fashion (i.e., claim 1; paragraph 0121). Chen et al also teach the tape substrate comprises a metallic electrode layer (paragraph 0119). The metallic electrode layer is a contact element (i.e., claim 1), and Chen et al teach the substrate has the added advantage of improving efficiency of hybridization of the immobilized probe to a target (paragraph 0154). Thus, Chen et al teaches the known technique of spotting molecules immobilized on a tape as well as the known teaching of using a substrate having electrical contact elements.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the method comprising a plurality of immobilized (i.e., fixed) reagents on a substrate as taught by Chateau so that the immobilized reagents (i.e., probes) are spotted on the substrate to form spot arrays in each biochip (i.e., reaction area) and so that the substrate has electrical contact

elements thereon as taught by Chen et al to arrive at the instantly claimed method with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in a method having the added advantage of allowing deposition of probe molecules on a tape in a high speed and continuous fashion as well as the additional added advantage of improving efficiency of hybridization of the immobilized probe to a target as explicitly taught by Chen et al (paragraphs 0121 and 0154). In addition, it would have been obvious to the ordinary artisan that the known techniques of spotting molecules immobilized on a tape and having the contact elements on the substrate as taught by Chen et al could have been applied to the method of Chateau with predictable results because the known techniques of spotting molecules immobilized on a tape and having the contact elements on the substrate as taught by Chen et al predictably result in a reliable method of fixing the molecules on the biochip and also predictably result in a substrate useful for biomolecular binding assays.

While Chateau teaches a detector on the form of reading station 36, which reads the results (i.e., measures the assays; column 7, lines 30-40), neither Chateau nor Chen et al teach electrical measurements are carried out from below the substrate with the aid of contact elements; i.e., so that measurements are with biochips that are electrically readable (i.e., claims 1 and 12).

However, Gordon et al teach electrically readable biochips wherein spots of oligonucleotides 48 are attached to an uppermost layer of electrode 44 (Figures 1-2 and paragraphs 0015 and 0091). Gordon et al also teach the electrodes (i.e., 119 of Figure

4) have electrical contacts for measurements, in the form of data and address buses 126, 128, and 130, are below the substrate 112 (Figures 4 and paragraph 0131), which has the added advantage of allowing selective chemical activity at specific electrodes on the chip (paragraph 0040). Thus, Gordon et al teach the known technique of using electrically addressable biochips (i.e., claim 12) having electrical contact elements for measurements to be carried out from below the substrate (i.e., claim 1).

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the method comprising a substrate having biochip comprising an electrode with a biomolecule immobilized thereon as taught by Chateau in view of Chen et al so that the biochip is an electrically readable biochip (i.e., claim 12) having contact elements for measurements that are carried out from below the substrate (i.e., claim 1) to arrive at the instantly claimed invention as taught by Gordon et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in a method having the added advantage of allowing selective chemical activity at specific electrodes on a biochip as explicitly taught by Gordon et al (paragraph 0040). In addition, it would have been obvious to the ordinary artisan that the known technique of using the electrically addressable biochips having electrical contact elements for measurements to be carried out from below the substrate of Gordon et al could have been applied to the method of Chateau in view of Chen et al with predictable results because the biochips and elements of Gordon et al predictably result in a substrate useful having individually addressable electrodes.

Regarding claim 2, the method of claim 1 is discussed above. Chateau also teaches temperature regulation and air conditioning is interposed between the applying and analyzing; namely, the tape proceeds through incubation enclosure 31 after depositing the measurement liquid by needle 28 but before the tape reaches result reading station 36 (Figure 2). The incubation enclosure 31 is identical to incubation enclosure 20, which controls temperature and humidity (column 5, lines 59-60), thereby interposing temperature and air conditioning on the sample. Chateau further teaches at least one spot array is enclosed by a hollow body in order to create a spatial separation from other spot arrays; namely, the substrate tape is run through enclosure 31 (Figure 2). Because at least one area 13 is held in the enclosure (column 5, lines 59-60 and claim 4), at least one spot array is held therein and is spatially separated from other spot arrays.

While Chateau does not teach the hollow body encloses the spot array with a peripheral wall, Chen et al teach a hollow body in the form of a mostly water-tight capillary is formed by closing a lid (i.e., placing a wall) on a narrow slot on a substrate, which peripherally encloses at least one spot of an array on the substrate because the capillary and lid peripherally seals the array substrate therein (Figures 17a-b and paragraph 0160). Chen et al also teach the peripheral wall has the added advantage of allowing improved hybridization efficiency (paragraph 0160). Thus, Chen et al teach the hollow body surrounds the spot array in a sealing fashion with a peripheral wall.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the method comprising a

enclosing a spot array on a substrate within a hollow body as taught by Chateau in view of Chen et al so that the enclosing of the spot array is accomplished with the peripheral wall as taught by Chen et al to arrive at the instantly claimed method with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in a method having the added advantage of allowing improved hybridization efficiency as explicitly taught by Chen et al (paragraph 0160). In addition, it would have been obvious to the ordinary artisan that the known technique of using the peripheral wall of Chen et al could have been applied to enclose the biochip in the method of Chateau in view of Chen et al in view of Gordon et al with predictable results because the peripheral wall of Chen et al predictably results in an enclosing step useful in hybridization reactions.

Regarding claim 3, the method of claim 2 is discussed above. Chateau also teaches the air conditioning serves as residence time of the measurement sample on the biochip; namely, the air conditioning in incubation enclosure 31 controls the humidity of the deposited sample (column 4, lines 59-60 and claim 4) for a specific period of time (column 8, lines 15-20).

Regarding claim 4, the method of claim 1 is discussed above. Chateau also teaches temperature regulation is interposed between the applying and analyzing of the sample liquid; namely, the tape proceeds through incubation enclosure 31 after depositing the measurement liquid by needle 28 but before the tape reaches result reading station 36 (Figure 2). The incubation enclosure 31 is identical to incubation enclosure 20, which controls the temperature (column 5, lines 59-60).

Regarding claim 7, the method of claim 2 is discussed above. Chateau also teaches the hollow body serves for air conditioning of the gas phase present above a spot array; namely, the spot arrays are the biochips, which are contained in enclosure 31, which is a hollow body. Because hollow body enclosure 31 controls the temperature and humidity of the deposited sample (column 4, lines 59-60 and claim 4), the gas phase (i.e., the air) above the spot array is air conditioned.

Regarding claim 9, the method of claim 1 is discussed above. Chateau further teaches the substrate is made of a flat material; namely, a flat tape (Figures 1 and 2 and column 4, lines 28-39).

Regarding claim 10, the method of claim 9 is discussed above. Chateau teaches a band-shaped substrate made of flexible material is used; namely, a flexible tape (Figures 1 and 2 and column 4, lines 28-39), which is band-shaped.

Regarding claim 11, the method of claim 10 is discussed above. Chateau also teaches the band-shaped substrate is unwound from the roll in cartridge 2 (Figure 2 and column 4, lines 45-55) and transported through reading station 36, which is an analysis device (Figure 2 and column 7, lines 33-50).

Regarding claim 13, the method of claim 1 is discussed above. Chateau further teaches the substrate has analysis specific data present; namely, the each biochip (i.e., reaction area) on the substrate has data relating the specimen and specimen treatment, which is analysis specific data, recorded along the side of the tape next to each biochip (column 2, lines 57-66).

Regarding claim 14, the method of claim 1 is discussed above. Chateau teaches heat is supplied or dissipated from the rear side region of the substrate opposite to the array; namely, the tape is heated in enclosure 31 (column 4, lines 59-60 and claim 4). Because the entire enclosure 31 is heated, at least some heat is supplied or dissipated from the rear side region of the tape, which is opposite the array.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chateau (U.S. Patent No. 4,071,315, issued 31 January 1978) in view of Chen et al (U.S. Patent Application Publication No. US 2001/0051714 A1, published 13 December 2001) in view of Gordon et al (U.S. Patent Application Publication No. US 2001/0036641 A1, published 1 November 2001) as applied to claims 1 and 14 above, and further in view of Kledzik et al (U.S. Patent No. 4,384,199, issued 17 May 1983).

Regarding claim 15, the method of claims 1 and 14 is discussed above in Section 8.

While Chateau also teaches a rear side region is brought into contact with a coolable or heatable body via heating in enclosure 31 (column 4, lines 59-60 and claim 4), neither Chateau, Chen et al, nor Gordon et al teach heating by planar contact with a heatable body from underneath the rear side region of the substrate.

However, Kledzik et al teach a heat transfer system that is positioned below an array substrate, wherein the heating of the substrate (i.e., a slide) is accomplished by contacting with a planar (i.e., substantially flat) metal block (Abstract), which is a heatable body and has the added advantage of efficiently transferring heat directly to

the substrates (column 5, lines 15-30). Thus, Kledzik et al teach the known technique of heating by planar contact with a heatable body from underneath a rear side region.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the method comprising heating of a spot array as taught by Chateau in view of Chen et al and Gordon et al so that the heating is accomplished via planar contact with a heatable body from underneath a rear side region of the substrate as taught by Kledzik et al to arrive at the instantly claimed method with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in a method having the added advantage of efficiently transferring heat directly to the substrates as explicitly taught by Kledzik et al (column 5, lines 15-30). In addition, it would have been obvious to the ordinary artisan that the known technique of using the known technique of heating by planar contact with a heatable body from underneath a rear side region as taught by Kledzik et al could have been applied to the method of Chateau in view of Chen et al and Gordon et al with predictable results because the known technique of heating by planar contact with a heatable body from underneath a rear side region as taught by Kledzik et al predictably results in a reliable method of heating a substrate.

Response to Arguments

10. Applicant's arguments filed 7 July 2008 (hereafter the “Remarks”) have been fully considered but they are not persuasive for the reason(s) listed below.

A. It is noted that the Applicant's arguments submitted with the Request for Continued Examination filed 21 March 2008 are identical arguments submitted with the Remarks (i.e., the arguments filed 7 July 2008). Therefore, the response to the Remarks below addresses all of Applicant's arguments filed both on 21 March 2008 and filed on 7 July 2008.

B. It is further noted that on page 5 of the Remarks, Applicant states that claims 16-27 and 29-31 have been cancelled. However, the instant listing of the claims lists claims 16-27 and 29-31 as withdrawn, not cancelled.

As stated in the Examiner-Initiated Interview Summary included with this Office Action, Applicant's representative Erin Hoffman confirmed by telephone on 23 October 2008 that claims 16-27 and 29-31 have been cancelled.

C. As also stated in the Examiner-Initiated Interview Summary included with this Office Action, the examiner specifically requests that Applicant confirm the status of claims 16-27 and 29-31 in the response to this Office Action so that the status of the claims is clear.

D. Applicant argues on pages 6-7 Gordon et al do not teach contacts that are below the substrate.

However, as detailed in the rejection above, Gordon et al teach electrically readable biochips wherein spots of oligonucleotides 48 are attached to an uppermost layer of electrode 44 (Figures 1-2 and paragraphs 0015 and 0091). Gordon et al also teach the electrodes (i.e., 119 of Figure 4) have electrical contacts for measurements, in the form of data and address buses 126, 128, and 130, are below the substrate 112

(Figures 4 and paragraph 0131), which has the added advantage of allowing selective chemical activity at specific electrodes on the chip (paragraph 0040). Thus, Figure 4 clearly shows electrical contacts 126, 128, and 130, are below substrate 112.

E. Applicant also argues on page 7 of the Remarks that the motivation provided by Gordon el al is entirely unrelated to the probes solved by the instant specification; i.e., that Gordon et al do not teach faster analysis by carrying out electrical measurements and that Gordon et al is nonanalogous art.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., faster analysis) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The method as claimed (in independent claim 1) merely recites a method "for performing a high throughput analysis, in which sample are analyzed in a continuous manner…," but does not recite, nor has Applicant indicated, any specific claimed method step or claimed structural requirement of the method that directly results in the alleged "faster analysis." Also, the claimed "high-throughput analysis" and the argued "faster analysis" are relative terms, which are not defined by either the claim or the specification; thus, the claimed "high-throughput analysis" and the argued "faster analysis" do not establish any threshold value of improvement over any of the prior art techniques.

In addition, Chateau specifically teaches the method results in a considerable speeding up of the tracking down operations on a great many specimens (column 7, lines 50-55). Thus, Chateau specifically teaches faster analysis.

Furthermore, in response to applicant's argument that Gordon et al is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, Gordon et al clearly teach the use of electrically readable biochips wherein spots of biopolymers in the form of oligonucleotides are attached to an uppermost layer of an electrode array (Figures 1-2 and paragraphs 0015 and 0091). Thus, the prior art of Gordon et al is analogous to that of both Chateau and Chen et al, both of which concern biopolymer arrays.

F. Applicant's remaining arguments on pages 7-9 of the Remarks refer to the alleged deficiencies of the method of Chateau in view of Chen et al and Gordon et al. These arguments are considered above. Because the arguments regarding the alleged deficiencies of the method of Chateau in view of Chen et al and Gordon et al were not persuasive, the remaining claims remain rejected.

Conclusion

11. No claim is allowed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571)272-1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert T. Crow/
Examiner, Art Unit 1634

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